

CHAPTER 10 GEOLOGY, SOILS, AND SEISMICITY

10.1 SETTING

The DeWitt Center Study Area is located in the western foothills of the Sierra Nevada mountain range at an elevation of about 1,400 feet in a complex geologic environment. Elevations across the project area range from 1,375 to 1,435 feet. Slopes within DeWitt Center generally range from 2 to 15 percent. *Figure 2-1* in **CHAPTER 2, PROJECT DESCRIPTION** provides the USGS topographical data for the project site.

This chapter is based on the *DeWitt Center Existing Conditions Report* (NFA/URS 2002), the *Geotechnical Engineering Report for Land Development Building* and *Geotechnical Engineering Report for Auburn Justice Center* prepared by Holdrege & Kull in November 2002 (2002a and 2002b, respectively), and the U.S. Department of Agriculture (USDA) Soil Conservation Service *Soil Survey for Placer County* (1980). The geotechnical engineering reports are included in this EIR as Appendix E. Additional geotechnical engineering reports will be prepared for the Children's Emergency Shelter and Women's Center (CES and WC) projects during subsequent project-level environmental review.

Geology

Geologic history has been divided into many eras representing chapters of Earth's past. The three most recent eras are the Cenozoic (65 million years ago to today), Mesozoic (248 to 65 million years ago), and Paleozoic (543 to 248 million years ago). The Jurassic Period represents a portion of the Mesozoic Era and dates between 144 and 206 million years ago. The Quaternary Period covers a portion of the Cenozoic Era and dates from 1.8 million years ago to today. The geologic history of the rocks and soils within the project area can be traced back to their origins in some of these historic time periods.

The western slope of the Sierra Nevada is underlain by a series of metamorphic rock assemblages that trend NNW-SSE between the Mesozoic granitics of the Sierra Nevada batholiths on the east and the sediment-filled Sacramento Valley to the west. These metamorphic rocks were developed by convergent plate tectonics in the Early Paleozoic to Late Jurassic (400 to 120 million years ago) and consist of three northerly-trending units bound by faults and classified on the basis of age and lithology: the Eastern, Central, and Western metamorphic terranes (NFA/URS 2002).

DeWitt Center is located in the eastern portion of the Western Metamorphic Terrane, predominantly consisting of Jurassic igneous and sedimentary rocks of island-arc origin. The site is underlain by rocks known as the Smartville Complex, composed of mafic/intermediate volcanic and plutonic rocks formed along an island-arc chain, whose outcrops west of State Route 49 are controlled by NW-trending gently dipping folds that fall to the SE (NFA/URS 2002). *Figure 10-1* is a geologic map of the region surrounding DeWitt Center, which indicates that bedding in the vicinity of the site trends NW to SE and dips from 15 to 70 degrees towards the NE.

Soils

Approximately 95 percent of the DeWitt Center Study Area is underlain by soil identified as Auburn silt loam with 2 to 15 percent slopes; the remainder is underlain by Auburn-Rock outcrop complex with 2 to 30 percent slopes (USDA Soil Conservation Service 1980). The dominant soil is a shallow, undulating to rolling, well-drained material underlain by vertically tilted metamorphic rock and formed as a residual deposit due to the weathering of the parent rock. The Auburn-Rock outcrop complex occurs in only two locations: along the extreme western margin of DeWitt Center west of the abandoned wastewater treatment pond; and along Atwood Road south of the Main Jail. It is characterized as approximately 60 percent Auburn soil (described above) and 15 percent metamorphic rock outcrop exposed on the rocky side slopes. The soil is shallow, well drained, and moderately permeable, with very rapid surface runoff, and formed by the weathering of the underlying vertically tilted metabasic bedrock. Neither the Auburn silt loam nor the Auburn-Rock outcrop falls within the Class I or II capability classes, which are the classes most favorable for agricultural production. Individual characteristics of the soil units are as follows. *Figure 10-2* maps the soil types at DeWitt Center.

Auburn Silt Loam

This is the predominant soil type on the project site. It is a shallow, undulating to rolling, well drained soil, underlain by metamorphic rock. The shallowness leads to moderate permeability and surface runoff. The erosion hazard is slight to moderate. This soil is mainly used for irrigated pasture and rangeland, with some areas used for deciduous orchards. The major limitation to urban use is the depth to rock, which limits the potential for septic systems (which are not included in the proposed project).

Auburn-Rock Outcrop Complex

This undulating to hilly soil and rock outcrop soil type occurs at the northeastern boundary and southwestern quarter of the project site. The Auburn soil, which makes up approximately 60 percent of this complex, is shallow and well drained. Surface runoff is medium-to-rapid, with erosion hazard ranging from slight-to-high. This soil complex is mostly used for annual rangeland. The major limitations to urban use are rock outcrops, the depth to rock, and the slopes. Cuts and fills generally need to be limited to approximately six feet, and the potential for individual septic systems is limited.

Geotechnical Exploration

In order to assess geology and soils on a local project level, Holdrege & Kull performed geotechnical evaluations of the proposed Land Development Building (LDB) site and the proposed Auburn Justice Center (AJC) site. They excavated seven exploratory trenches on the proposed LDB site and fifteen exploratory trenches on the proposed AJC site. The trenches were excavated using a Case 580 backhoe which reached a maximum depth of 4.5 feet at the LDB site and 9 feet at the AJC site. Exploration below these depths was limited by resistant metamorphic rock.

The *Geotechnical Engineering Report for Land Development Building* and *Geotechnical Engineering Report for Auburn Justice Center* (Holdrege & Kull 2002a and 2002b, respectively) will be submitted to the Placer County Department of Public Works for review and approval in

Figure 10.1 (11x17)

Figure 10.2

conjunction with applications for grading permits. Appropriate recommendations contained in the reports will be incorporated into Improvement Plans and Building Plans for each project site. Separate site-specific geotechnical engineering reports will be prepared for both the Children's Emergency Shelter and Women's Center projects and submitted to the Department of Public Works for approval in conjunction with grading permit applications.

Land Development Building

At the proposed LDB site, the trenches revealed that the surface soil consists mostly of native, residual soil underlain at shallow depths by severely to moderately weathered rock. Expansive clay was observed in two trenches at a depth of two to three feet. However, these exploratory trenches were located outside of the proposed building construction area. According to Holdrege & Kull, the expansive soil was generally encountered immediately above weathered metamorphic rock, and exhibited high expansion potential as classified under the Uniform Building Code guidelines. In addition, a deep sanitary sewer trench was observed during excavation of trench T-1, revealing a portion of backfill that was relatively dense, containing abundant gravel and angular rock up to twelve inches in diameter. *Figure 10-3* shows the locations of the exploratory trenches; deposits of expansive soil were found in trenches T-3 and T-4.

Auburn Justice Center

At the proposed AJC site, the trenches revealed that the majority of the central portion of the site is covered with existing fill and stockpiled soil that is deeper than ten feet in some areas. In the regions that were not covered by fill and stockpiled soil, the surface soil consists mostly of native, residual soil underlain at shallow depths by severely to moderately weathered rock. The trenches did not reveal any expansive soil. *Figure 10-4* shows the locations of the exploratory trenches. In addition, Holdrege & Kull observed a rock outcrop near the southeast and central-east portions of the site, and a drainage channel that bisects the southwest side of the site. This drainage is discussed as a wetland swale in **CHAPTER 9, BIOLOGICAL RESOURCES**.

Mineral Resources

The best assessment of mineral resources in the study area is the Mineral Land Classification of Placer County, prepared by the California Division of Mines and Geology in 1995 (Open File Report 95-10). A review of this document indicates that there were six mines or prospects, five gold and one copper, located within 2 miles of DeWitt Center. One of these mines or prospects is plotted as occurring on the DeWitt Center property, but the accuracy of the mapping is questionable. Open File Report 95-10 identifies the mine/prospect as the Black Ledge, located within a half mile of the project area. However, review of the primary reference cited is confusing. The Black Ledge is not discussed; rather, reference is made to "Black Lead, a former producer," which lies nearby to the south of the Two Orphans prospect and is within approximately one mile of the project area. No details are provided regarding specific location, vein orientation, and production history. No surface evidence has been found concerning this gold mine or prospect. Based on the existing mapping, known mine locations, and the lack of surface evidence of mining onsite, it is unlikely that the project area represents a source of known mineral reserves.

Figure 10.3

Figure 10-4

Seismicity

The foothills of the Sierra Nevada are characterized by low seismicity. Data compiled between 1808 and 1987 show that only 15 earthquakes between magnitudes 3.0 and 5.7 were recorded along the Foothills Fault System between Mariposa and Oroville. Studies of past seismic events conclude that the maximum credible earthquake for the Foothills Fault System would be a Richter magnitude 6.5 event (NFA/URS 2002).

Surface soil in the project area is generally relatively thin and unsaturated, and the site is underlain at shallow depths by dense, metavolcanic rock. This combination results in a low potential for liquefaction and lateral spreading at the site.

Faulting

DeWitt Center is located in the western portion of the Foothills Fault System, between the Melones Fault Zone about 15 miles to the east and the Bear Mountain Fault Zone within about one mile to the west. With the occurrence of the 1975 magnitude 5.7 Oroville earthquake, located on the Cleveland Hill Fault in the northern portion of this fault system, and the 1989 magnitude 4.3 Emigrant Gap earthquake, located in eastern Placer County, the Foothills Fault System is considered to have a low to moderate level of activity. Significant investigations have occurred along the trend of the Foothills Fault System since 1975. The three segments of the Bear Mountain Fault Zone identified on the Fault Activity Map of California and Adjacent Areas closest to DeWitt Center are the Highway 49 Lineament eight miles to the north, the Maidu East Lineament four miles to the southeast, and the Rescue Lineament eleven miles to the southeast. These faults are classified by the California Division of Mines and Geology (CDMG) as having last moved in the Late Quaternary (the last 700,000 years) (NFA/URS 2002).

Consultants to the U.S. Bureau of Reclamation Extension conducted geoseismic studies associated with the proposed Auburn Dam after the 1975 Oroville earthquake. One of the geologic structures evaluated was the DeWitt lineament or fault zone, which had been identified by geologic mapping and air photo interpretation. The DeWitt Fault Zone trends in a NW-SE direction from the Bear River through Auburn (NFA/URS 2002). Woodward-Clyde Consultants excavated and logged three exploratory trenches across this feature as follows:

- Hubbard Road site – located southeast of Big Hill near Dry Creek, about two miles northwest of DeWitt Center;
- Bean Road site – about five miles due south of DeWitt Center; and
- St. Joseph site – about six-tenths of a mile southeast of DeWitt Center (Schwartz et al., 1977).

The results of the trenching studies indicated that the DeWitt Fault Zone is a significant zone of deformation generated during episodes of fault movement in the Mesozoic, with evidence of late Quaternary displacement at the Hubbard Road site.

The CDMG investigated the DeWitt segment of the Bear Mountain Fault Zone north of Auburn as part of the 10-year fault evaluation program (NFA/URS 2002). This study indicated that deformation along the Bear Mountain Fault Zone is occurring near Auburn. However, this strain is distributed along several Mesozoic-age shear zones over a several mile wide zone. Holocene (the last 11,000 years) faulting could not be ruled out along the DeWitt Fault Zone,

but the zone is not well defined and displacement rates are probably too small to produce significant surface rupture. Therefore, the DeWitt Fault Zone has not been designated as a special study zone under the provisions of the Alquist-Priolo Act (NFA/URS 2002).

10.2 REGULATORY FRAMEWORK

Soils disturbance, including grading and other site preparation activities, are primarily regulated at the local level through the *Auburn/Bowman Community Plan* and *Placer County General Plan*, but may be subject to State and federal regulations as well. The *Placer County Grading Ordinance* establishes requirements for grading, erosion control, and stormwater design with which development projects must comply during grading and construction. Other responsible agencies, including the U.S. Army Corps of Engineers, the State Water Resources Control Board, and California Department of Fish and Game have also developed standards and guidelines.

Auburn/Bowman Community Plan

The *Auburn/Bowman Community Plan* contains policies governing development in the project vicinity. Below is a list of geology and soils goals and policies, found in the Environmental Resources Management Element of the *Auburn/Bowman Community Plan*, that are applicable to the DeWitt Government Center Facility Plan project.

Goals IV.B.1a

1. Conservation of soils as a valuable natural resource.
2. Minimize soil loss due to accelerated erosion.
3. Minimize the conversion of soils suitable for agricultural purposes to non-agricultural uses.

IV.B.1.b(1) Utilize the existing inventory of important resources prior to the project development. In the absence of more detailed site specific studies, determination of soil suitability for particular land uses shall be made according to the Soil Conservation Service's Soil Survey of Placer County.

IV.B.1.b(4) Ensure implementation of the *Placer County Grading Ordinance* to protect against sedimentation and soil erosion.

IV.B.1.b(6) Developers shall provide adequate drainage and erosion control during construction as described in the *Placer County Land Development Manual*.

Goals IV.B.2.a

1. Minimize loss of life, injury, damage to property, and impacts to human health resulting from geological hazards.
2. Identify and protect important geological and mineral resources in the plan area.

B.2.b(2) Require a soils report on all building permits and grading permits within areas of known slope instability or where significant potential hazard has been identified.

- B.2.b(4) During project review, consider the development limitations of geologic formations.
- C.2.a Protect all economically valuable resources, including mineral deposits, soils conducive to agricultural uses, and those open areas which add to the overall attractiveness of the region.

Placer County General Plan

The Health and Safety Element and the Land Use Element of the *Placer County General Plan* contain goals and policies which, in part, frame the discussion of project impacts related to geologic hazards. The geology and soils goals and policies applicable to the DeWitt Government Center Facility Plan project are listed below.

- Goal 1.J:** To encourage commercial mining operations within areas designated for such extraction, where environmental, aesthetic, and adjacent land use compatibility impacts can be adequately mitigated.
- I.J.3 The County shall discourage the development of any uses that would be incompatible with adjacent mining operations or would restrict future extraction of significant mineral resources.
- Goal 1.K:** To protect the visual and scenic resources of Placer County as important quality-of-life amenities for county residents and a principal asset in the promotion of recreation and tourism.
- 1.K.4 The County shall require that new development incorporates sound soil conservation practices and minimizes land alterations. Land alterations should comply with the following guidelines:
- a. Limit cuts and fills;
 - b. Limit grading to the smallest practical area of land;
 - c. Limit land exposure to the shortest practical amount of time;
 - d. Replant graded areas to ensure establishment of plant cover before the next rainy season; and
 - e. Create grading contours that blend with the natural contours on site or with contours on property immediately adjacent to the area of development.
- Goal 8.A:** To minimize the loss of life, injury, and property damage due to seismic and geological hazards.
- 8.A.1 The County shall require the preparation of a soils engineering and geologic-seismic analysis prior to permitting development in areas prone to geological or seismic hazards (i.e., groundshaking, landslides, liquefaction, critically expansive soils, avalanche.)
- 8.A.2 The County shall require submission of a preliminary soils report, prepared by a registered civil engineer and based upon adequate test borings, for every major subdivision and for each individual lot where critically expansive soils

exist, unless suitable mitigation measures are incorporated to prevent the potential risks of these conditions.

- 8.A.3 The County shall prohibit the placement of habitable structures or individual sewage disposal systems on or in critically expansive soils unless suitable mitigation measures are incorporate to prevent the potential risks of these conditions.
- 8.A.4 The County shall ensure that areas of slope instability are adequately investigated and that any development in these areas incorporates appropriate design provisions to prevent landsliding.

State and Federal Regulations

State and federal permits related to disturbance of soils and impacts on the site's geology, which may be required for the proposed project, include:

- U.S. Army Corps of Engineers Nationwide Permit 12;
- California Department of Fish and Game Streambed Alteration Agreement; and
- SWRCB General Construction Activity Storm Water Permit.

10.3 IMPACTS

Significance Criteria

Project impacts may be considered significant if construction results in geologic hazards which could expose the public to additional health and safety risks. Significance criteria are provided by Appendix G of the CEQA Guidelines and by policies contained in the *Placer County General Plan* and the *Auburn/Bowman Community Plan*. A significant geologic impact would result if the proposed project could:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault,
 - Strong seismic ground shaking,
 - Seismic-related ground failure, including liquefaction, and/or
 - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in *Table 18-1-B* of the Uniform Building Code (1997), creating substantial risks to life or property;

- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water; or
- Result in significant alterations to existing landforms.

Project Impacts

Impacts Determined to be Less than Significant

Exposure of People or Structures to Risks Associated with Seismic Activity. Although no faults capable of ground rupture have been identified at the project area, DeWitt Center is located within the Foothills Fault System, which has low to moderate seismic activity. This system has been characterized as having the potential to produce maximum earthquakes of Richter magnitude 6.5. In addition, the project area is within the vicinity of the DeWitt Fault, however, this fault is not an Alquist-Priolo mapped fault based on its lack of activity in recent periods. As in all areas of California, development of the project could potentially result in exposure of people and property to the hazards of ground shaking and surface rupture associated with earthquake activity. All new structures constructed throughout the project area will conform to Placer County standards and the Uniform Building Code (UBC). Adherence to these standards would ensure that buildings at DeWitt Center would be constructed to withstand anticipated seismic activities, thereby reducing the risk of personal injury or property damage. Impacts from seismic hazards are considered less than significant when UBC standards are met.

Seismic and other geologic forces can also contribute to risks of exposure to volcanic activity and ocean effects, such as tsunamis (seismically-generated sea waves). The project area is geographically removed from these risks. The nearest known active volcanic center is Mt. Lassen, approximately 95 miles north of the area, and the Pacific Ocean is more than 100 miles to the west. The project area is not at risk to exposure to these types of geologic hazards.

Due to the fact that site surface soil is generally relatively thin and unsaturated, and is underlain at shallow depths by dense, metavolcanic rock, there is a low potential for liquefaction and lateral spreading within the project sites (Holdrege & Kull 2002a and 2002b). The project area is relatively flat; therefore landslides are not a potential risk at the proposed construction or demolition sites. Slopes in the project vicinity are no more than 30 percent, and generally range between two and fifteen percent. Elevations across the project area range from 1,375 to 1,435 feet above sea level.

Stability of Geologic Unit and Soil. Holdrege & Kull did not observe any subsurface seepage during trench excavation at the LDB and AJC sites. However, they anticipate that seepage will be encountered near the surface soil/metamorphic rock during and after the rainy season. Additionally, they expect that into the summer months, the groundwater level may be perched on rock in relatively level or gently sloping areas. In the AJC site, wet soil conditions are expected in the region of the drainage that bisects the site.

Impacts from placing buildings or roads in areas with unstable soils would be largely avoided by ensuring compliance with standard grading, soil conditioning, and building practices. This will avoid exposure of people and structures to hazards related to expansive and unstable soils, seepage, or liquefaction. Extraction of groundwater, oil, or gas from the subsurface of the

project site is not proposed; therefore, subsidence, or settling of the land surface, is not expected to occur. As discussed above, slope instability impacts, including landslides and mudflows, are considered to be a less than significant risk due to the lack of steep slopes in the project area. According to the rough grading plans for the LDB and AJC, proposed maximum slopes after grading at each site are between two and four percent. These slopes are necessary to direct stormwater drainage from the parking lots. No retaining walls are proposed for either the LDB or the AJC. The proposed slopes for the LDB and AJC are considered to have less than significant impacts with respect to slope stability.

Ability of Soils to Support Septic Systems. The new buildings proposed for construction in the DeWitt Government Center Facility Plan will all be served by the Placer County Sewer Maintenance District #1, as discussed in **CHAPTER 13, PUBLIC SERVICES**. No septic tanks or alternative wastewater disposal systems are proposed, therefore there is no impact with respect to the ability of project area soils to support such systems.

Potentially Significant Impacts

Impact 10.1: Soil Erosion and Loss of Topsoil

Significance Before Mitigation:	Significant
Mitigation:	10.1a through 10.1h
Significance After Mitigation:	Less than Significant

Development of the proposed project would require grading for the construction of building pads, parking lots, and utility service lines. The removal of vegetative cover and earth moving resulting from site preparation activities would disturb topsoil and expose it to increased risks of erosion from wind and water. Rain and water runoff could erode the exposed soils, transporting sediments into the project area's drainageways and potentially degrading aquatic ecosystems. Implementation of *Mitigation Measures 10.1a through 10.1f* will minimize the impacts related to erosion and siltation to less than significant levels and will preserve study area soils to the extent feasible.

Demolition is anticipated to strip all vegetation, building pads, and paving from the demolition sites. *Mitigation Measure 10.1c* provides standards for reestablishment of vegetation and ground covers in these sites. Wind erosion impacts on air quality due to windborne dust particles are discussed in **CHAPTER 7, AIR QUALITY**.

The rough grading plans for the AJC include the establishment of cut and fill banks along the perimeter of the site. The cut bank is expected to range approximately between one and ten feet in height and between one and 25 feet in width. The fill bank along the western site boundary is also expected to range between one and ten feet in height and between one and 20 feet in width. Preliminary grading plans will be submitted to the Department of Public Works for review and approval prior to issuance of grading permits. This review will ensure that slopes for cut and fill areas will not exceed allowable limits. With implementation of *Mitigation Measure 10.1e*, which provides for revegetation of the exposed slopes, the creation of these cut and fill banks is expected to have less than significant impacts with respect to soil erosion.

Impact 10.2: Creation of Substantial Risks to Life or Property Related to Expansive Soils

Significance Before Mitigation:	Significant
Mitigation:	10.2a through 10.2d
Significance After Mitigation:	Less than Significant

Exploratory trenches excavated during the geotechnical studies of the proposed LDB site found areas of expansive soils. *Mitigation Measures 10.2a through 10.2d* provide site preparation standards that will avoid or minimize any hazards related to the expansive soils. Although expansive soil was not observed at the AJC site, this soil type may exist there given the presence of expansive soil in the surrounding area and large amounts of stockpiled soil onsite. Moreover, the existing fill and stockpiled soil was generally loose and incapable of supporting the proposed AJC development (Holdrege & Kull 2002b). Compliance with mitigation measures will ensure that the fill and stockpiled soil is removed, processed, and replaced properly in order to provide suitable use as fill for the proposed development.

Impact 10.3: Alteration of Existing Landforms

Significance Before Mitigation:	Significant
Mitigation:	10.3a through 10.3e
Significance After Mitigation:	Less than Significant

As discussed above, DeWitt Center is relatively flat, with very little topographic variation. Elevations onsite range between 1,375 and 1,435 feet above sea level. Existing slopes at the LDB site range between zero and two percent, while existing slopes at the AJC site range between zero and eight percent, with the steepest slopes associated with the wetland swale that passes through the southern portion of the site. The alteration of site topography is an unavoidable result of development. Grading of building pads and parking lots, and trenching for utility services can result in significant changes to the topography of the project area.

According to the rough grading plans for the LDB, proposed maximum slopes after grading are between two and four percent. These slopes would be located in the parking area south of the building and would function to direct most stormwater drainage toward the southwest corner of the LDB site. The LDB grading plans also provide for creation of a detention pond system, consisting of two separate ponds with a depth of four feet, connected by an 18-inch diameter pipe, in the northwest corner of the site to accommodate stormwater drainage from the northern portion of the LDB site, and for preservation of a small hill in the northeast corner of the site, which would be landscaped with a combination of ground covers and trees. At this site, it is anticipated that grading will include scarification and recompaction of near surface soil, but relatively minor cuts and fills. Maximum cut depths are expected to be 30 inches, with the exception of five-foot deep trenches for utility lines and four-foot deep detention ponds. Fills onsite are expected to reach 30 inches. A total of 5,000 cubic yards of soil is expected to be moved onsite, with cut and fill amounts balancing. The existing landforms at the LDB site will not be altered significantly.

Rough grading plans for the AJC indicate that the maximum proposed slopes within the parking and building areas are between three and four percent, while slopes on the cut and fill banks are a maximum ratio of 1:2. Maximum cuts and fills at the AJC site are expected to be ten

feet, with the majority of cuts and fills being between zero and five feet. It is anticipated that $\pm 12,500$ cubic yards of soil will be moved on the site and that cut and fill amounts will balance. Additionally, the AJC grading plans incorporate a vegetated berm along the eastern side of the AJC building, a cut bank around the eastern side of the southern parking lot, and a fill bank along the western boundary of the Ancillary Building. These features will provide topographic relief on the site, thus lessening impacts from project development. The AJC site is currently relatively flat, and characterized by a high level of previous disturbance. The creation of the berms and cut and fill banks will create a potentially significant alteration of existing landforms.

The proposed project includes expansion of the DeWitt Center Detention Basin, located west of the Main Jail, to accommodate the additional stormwater runoff that would result from the increases in impervious surfaces at the LDB and AJC sites. The grading associated with this expansion is expected to occur concurrent with the grading at the AJC site. The detention basin is proposed to be expanded by approximately 80,000 cubic feet. This cut soil would be deposited throughout DeWitt Center, in part as fill for permitted fills of wetlands, as discussed in **CHAPTER 9, BIOLOGICAL RESOURCES**, and in part as fill/topsoil for the proposed demolition sites. Identification of fill amounts and placement for the soil removed from the detention basin site would be included on the grading plans for the detention basin work which would be submitted to the Department of Public Works for review and approval prior to issuance of a grading permit, as required by *Mitigation Measure 10.3d*.

Cut for utility trenches for both the LDB and AJC will be a maximum of five feet deep. It is anticipated that utility trenches for the CES and WC projects will also be a maximum of five feet deep. This will be evaluated in subsequent project-level environmental review for those facilities. No retaining walls are proposed for either the LDB or the AJC. Retaining walls are not anticipated to be necessary for the CES and WC projects. This will also be evaluated in subsequent review.

Additional grading will occur within the proposed locations of the CES and WC, along right-of-ways for utility improvements (i.e., sewer and water lines), and along the open water pond in the southwest corner of DeWitt Center for construction of the riparian wetland (discussed in the **CHAPTER 9, BIOLOGICAL RESOURCES**). Site-specific geotechnical analyses will be prepared for the CES and WC projects and will be evaluated in subsequent project-level environmental review documents for those sites.

10.4 MITIGATION MEASURES

Soil Erosion and Loss of Topsoil

Mitigation Measure 10.1a: All proposed grading, drainage improvements, erosion control measures, and removal of vegetation and trees shall be shown on the Grading Plans for each project site (construction and demolition sites) and all work shall conform to provisions of the Placer County Grading Ordinance (Section 15.48, Placer County Code) and the Placer County Flood Control District's Stormwater Management Manual. No grading, clearing, or tree disturbance shall occur until the Grading Plans are approved by the Placer County Department of Public Works and grading permits have been issued. Separate Grading Plans shall be submitted and separate grading permits issued, for each project phase that involves earth work, including

demolition and construction at the Land Development Building site, construction at the Auburn Justice Center site, demolition at other proposed demolition areas (wastewater treatment plant; Buildings 204B, 205B, 206B, and 207A&B; and Buildings 212A&B through 217A&B), rough grading and provision of infrastructure at the Children's Emergency Shelter and Women's Center sites, and implementation of applicable Mitigation Measures (such as *Mitigation Measure 9.3a*, which requires creation of wetland habitat onsite.)

Mitigation Measure 10.1b: A geotechnical engineering report shall be prepared for each project phase that involves earthwork, as defined in *Mitigation Measure 10.1a*. Each geotechnical report shall be submitted to the Department of Public Works for review and approval concurrent with submittal of the Grading Plans as required in *Mitigation Measure 10.1a*.

Mitigation Measure 10.1c: Should onsite conditions vary substantially from the conditions anticipated based on the geotechnical engineering report and approved grading plans, site grading shall halt until a qualified geologist/engineer can assess site conditions and recommend appropriate changes to the approved grading plans. A revised grading plan shall be submitted to the Placer County Department of Public Works for approval.

Mitigation Measure 10.1d: Implement *Mitigation Measure 5.2a*, which requires revegetation and/or covering of demolition sites to minimize erosion. Final landscaping plans shall include revegetation and/or covering of these areas, while final grading plans shall include erosion control measures.

Mitigation Measure 10.1e: Implement *Mitigation Measure 7.1a*, which requires the submittal of a Construction Emission/Dust and Erosion Control Plan that includes specific Best Management Practices.

Mitigation Measure 10.1f: Implement *Mitigation Measure 9.3c*, which requires additional Best Management Practices to control erosion and sedimentation of onsite drainageways.

Mitigation Measure 10.1g: Implement the following additional Best Management Practices to minimize impacts to soils in the DeWitt Center Study Area:

- a) Maintain 50-foot setbacks for construction and grading activities from intermittent streams, riparian areas, and wetlands.
- b) Prepare a winterization plan for sites where construction is not completed by October 15.
- c) Minimize the depths of cuts and fills to the extent feasible.
- d) For surfaces at any project site that are not revegetated or covered, the County will employ other suitable BMPs, such as filter strips or vegetated swales, as necessary to minimize discharge of sediments offsite.

Creation of Substantial Risks to Life or Property Related to Expansive Soils

Mitigation Measure 10.2a: Fine grained, potentially expansive soil that is encountered during grading within proposed building locations and paved areas shall be mixed with granular soil or over-excavated and stockpiled for removal from the project site or for later use in landscape areas.

Mitigation Measure 10.2b: Soil preparation for fill placement, as well as fill placement and depth shall be conducted in accordance with the standards outlined in the *Geotechnical Reports* (2002) prepared by Holdrege & Kull for the Land Development Building and Auburn Justice Center sites or subsequent studies used (if any) for review of the grading plans for each project site. These reports are included in Appendix E of this EIR.

Mitigation Measure 10.2c: Consistent with the applicable code(s) and the recommendations of the geotechnical reports, a qualified technical personnel from the geotechnical consultant shall be present during grading of the proposed Auburn Justice Center site to determine the lateral and vertical extent of the existing fill and stockpiled soil.

Mitigation Measure 10.2d: Construction dewatering, subsurface drainage, and surface water drainage shall be performed in accordance to the standards highlighted in the *Geotechnical Reports* (2002) prepared by Holdrege & Kull for the Land Development Building and Auburn Justice Center sites. These standards can be found in Appendix E of this EIR.

Alteration of Existing Landforms

Mitigation Measure 10.3a: Implement *Mitigation Measure 10.1a*, which requires indication on Grading Plans of the extent of grading, drainage improvements, and vegetation removal.

Mitigation Measure 10.3b: The County's contractor shall implement sensitive grading techniques to blend landform alterations with the natural setting. These techniques include limiting grading areas, use of protective fencing around the dripline of oak trees (as stipulated in *Mitigation Measures 5.1b* and *9.1b*), blending cut and fill slopes into the natural terrain, rounding and feathering graded slopes into existing terrain to avoid an artificially contoured appearance, planting or otherwise protecting re-contoured slopes from the effects of water runoff and wind erosion within 90 days of completion of grading, and setting street elevations as close to the existing natural grade as possible.

Mitigation Measure 10.3c: If blasting is required for site grading or the installation of site improvements, the County will comply with applicable County ordinances and the Occupational Safety and Health Administration requirements that relate to blasting and use only State licensed contractors to conduct these operations.

Mitigation Measure 10.3d: Prior to issuance of a Grading Permit to allow for the earthwork associated with expansion of the DeWitt Center Detention Basin, the County will submit Grading Plans and Landscaping Plans to the Department of Public Works for

approval. The grading plans will include prescriptive practices for placement of all of the soil removed from the detention basin. Should the County propose to store or stockpile any of the excavated soil elsewhere within DeWitt Center, the grading plans shall indicate specific details of the location and configuration of the stockpile adequate to ensure that no additional impacts related to soil erosion or alteration of area hydrologic patterns will occur.

Mitigation Measure 10.3e: Prior to issuance of an Early Grading Permit to allow for onsite rough grading at the Land Development Building and Auburn Justice Center sites, the County will submit Improvement Plans, Rough Grading Plans, and preliminary Final Grading Plans, and any related documents as required, to the Department of Public Works for approval.